IAHS2022-444
IAHS-AISH Scientific Assembly 2022

Contaminants of emerging concerns in groundwater as tracers of antropization to small Mediterranean lagoons hydrosystems

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Coastal Mediterranean hydrosystems, especially Mediterranean lagoons provide a wide range of ecosystem goods and services that human societies take advantage from. Those socio-hydro-eco-systems are most of the time groundwater dependent ecosystems, however their hydrogeological functioning, essential for their management is still little-known.

Catchment anthropization is one of the highest pressure for the lagoons and can increase their ecological vulnerability, especially by the pollutants flowing to the lagoons *via* groundwater and surface water. The consideration of the groundwater as an inertial system with the ability to store pollutants is not yet taken into account by the water resource managers. South of Corsica is an interesting study area due to the presence of numerous small lagoons and a high rate of urbanization. The catchments of the Balistra, Santa Ghjulia and Arasu lagoons were investigated to explore the types and concentrations of contaminants of emerging concerns. These specific pollutants being considered here as relevant tracers of the coastal Mediterranean anthropization phenomenon with high population increase due to strong seasonal touristic activity.

An original multi-tracer approach, combining physico-chemical parameters, major ions and trace elements as well as, stable isotopes of the water molecule was carried out on 48 points divided in surface water (16 points), groundwater (18 points) and lagoon water (14 points) on the 3 watersheds. On selected relevant points, the analysis of emerging compounds was also realized to identify potential sources of pollutions.

Emerging compounds analysis shows that the three sites are concerned by contamination, nevertheless at very low content. DEET- diethyltoluamid have been found on 78% of the sampling points with concentrations between 16.2 ng/l to 198 ng/l. It is the most commonly found compounds in groundwater with caffeine and benzotriazoles.

The presence of emerging compounds in groundwaters of the 3 catchments with different level of anthropization reveals a high human footprint due to sewage system leakage which is a vector of pollution to the lagoons. In a context of global change, the hydrological balance of such systems is fragile and the degradation of the quality of groundwaters highlighted by the emerging compounds is increasing the vulnerability of the Mediterranean lagoons.